The typical ingredients are ammonium sulphate, single (and for high analysis compounds, triple) superphosphate and muriate of potash. Finely ground phosphate rock is used as an ingredient in potassic mineral phosphate (P.M.P.) and in a few other compounds.

46. A number of important compound fertilisers including most of the more concentrated are made by other processes. These include C.C.F. made by I.C.I. and some similar compounds made more recently by S.A.I.; Kaynitro* made by I.C.I.; and certain new compounds made by Fisons. *C.C.F.* In the process used by I.C.I. phosphate rock is ground and reacted with sulphuric acid and ammonium sulphate solution to yield a mixture of phosphoric acid and solid calcium sulphate. The latter is removed by filtration and ammonia gas is added to the filtrate, yielding monammonium phosphate. Some of the water is removed by evaporation and the solution is then mixed with potassium chloride and solid ammonium sulphate. The mixture is fed into a rotating cylinder where it is dried. The granules formed are screened for uniform size. *S.A.I.* produces four concentrated compounds based on ammonium phosphate. The process used, though it differs in some respects, is broadly similar to that used by I.C.I. *Kaynitro.* For this production ammonium nitrate solution is concentrated by steam heat under vacuum and then mixed with the main ingredients, solid ammonium sulphate and solid potassium chloride. The product is granulated and screened. Certain of *Fisons'* new compounds are also made from concentrated ammonium nitrate solution.

47. *Organic-inorganic compounds* are made by mixing two or more of a wide range of constituents including, on the inorganic side, potash, ammonium sulphate and superphosphate and, on the organic side, fish meal, bone meal, horns and hooves, dried blood, hop waste and sewage sludge. The product may be "pelletted", giving it a quasi-granulated form.

CHAPTER 2. THE HISTORY AND ORGANISATION OF THE CHEMICAL FERTILISER INDUSTRY

I. History

48. The use of chemical fertilisers to increase the productiveness of the soil dates from the early years of the nineteenth century. Despite this development, the ancient practices of using manure of animal origin (dung, bones, blood, wool waste) or of "green manuring"—i.e. the growing and ploughing in of "catch", or sometimes main, crops—have persisted as well. For many years after the development of chemical fertilisers Peruvian guano was imported in large quantities, and today farmyard manure and to a lesser extent other organic fertilisers still make an important contribution to soil nutrients in this country.

49. The first chemical fertiliser to be developed was *calcium superphosphate.* Early in the nineteenth century it was discovered that the phosphate present in bones could be made more readily available to the plant if the bones were dissolved in sulphuric acid. Shortly afterwards it was

* "KAYNITRO" is a registered trade mark.

discovered that the coprolitic nodules found in the Eastern Counties could be similarly dissolved and on this was based the manufacture of calcium superphosphate, for which a patent was taken out by Sir John Bennet Lawes in 1842. A number of works were established at British ports which supplied both home and export markets. Later in the century new sources of supply of phosphate rock were opened up, chiefly in North Africa, and by 1900 British production of single superphosphate was, as it is now, based largely on North African rock. Double superphosphate, made by treating rock with phosphoric acid, was made in the United Kingdom from the end of the century to the 1914–18 war. Triple superphosphate, representing a further concentration, was made in the same period, and its manufacture has been revived in the United Kingdom since the 1939–45 war. The use of *ground rock phosphate* as a fertiliser developed as a side line to the manufacture of superphosphate from North African rock. Commercial sales of *basic slag* for fertiliser use began towards the end of the century ; the slag was at first taken to the Continent for grinding, but later grinding mills were set up in this country and by 1899 production was well established.

50. The use of *nitrogenous* chemical fertilisers began early in the nineteenth century with the exploitation of the deposits of sodium nitrate in Peru* and the production of ammonium sulphate by the Gas Light and Coke Company for commercial use in 1833. Throughout the nineteenth century natural nitrates remained the principal source of chemical nitrogenous fertilisers, but supplies of ammonium sulphate, based on the by-product ammonia from gas works, shale distilleries and blast furnaces, gradually increased until by the end of the 1914–18 war they had assumed almost equal importance, a development which had been influenced to some extent by the export policy of Chile. During the early part of this century various processes for obtaining nitrogenous fertilisers from atmospheric nitrogen were evolved, but the commercial manufacture of synthetic sulphate of ammonia in the United Kingdom was begun only in 1922.

51. *Potash* is a constituent of some of the nitrates exported from South America but its first extensive use as a chemical fertiliser is associated with the exploitation in 1860 of the salt (potassium chloride) deposits discovered at Stassfurt in Saxony. Since then deposits have been developed commercially in France, Western Germany, Spain, other European countries, Israel and U.S.A. The United Kingdom has remained dependent on imports for supplies of potash.

52. *Compound fertilisers* began to be made in the first half of the nineteenth century, and historically their production is closely linked with that of superphosphates, as the first compounds often consisted of mixtures of superphosphates and guano or other animal matter. Subsequently mixtures containing only chemical constituents were developed.

The 1914–18 War

53. By 1914 the production of two important fertilisers—ammonium sulphate and single calcium superphosphate—was using considerable quantities of sulphuric acid. The increasing demand of the explosives industry for sulphuric and nitric acids at first led to the diversion from the fertiliser industry of a considerable proportion of its sulphuric acid supplies, but the

* The territory where the deposits occur is now part of Chile.

need to increase the home production of food led to a change of policy, and to meet the requirements for both agriculture and munitions suphuric acid capacity was increased, in part by the setting up of a number of Government acid plants. A Departmental Committee appointed by the Ministry of Munitions in 1917 to consider the post-war position of the sulphuric acid and fertiliser industries found that, with the increase in acid capacity to meet war needs and with the proposed establishment of a large zinc smelter in this country producing acid as a by-product, there would be a substantial surplus of acid capacity after the war. They agreed that any increase in the industrial consumption of acid would then almost entirely depend upon the development of the superphosphate industry, but that even so considerable surplus capacity would remain. They made a number of recommendations for meeting the situation including the formation of a comprehensive association of acid manufacturers to co-operate in the solution of the problems to be faced. The National Sulphuric Acid Association Ltd. was set up for this purpose in 1919, most acid manufacturers becoming and remaining members. Among other activities the Association subsequently handled imports of elemental sulphur for the use of its members.

54. During the war the Government took steps to control the fertiliser industry generally. It assumed the responsibility for imports of phosphate rock, encouraged production of basic slag as the phosphatic fertiliser which was indigenous and which also made no demands on sulphuric acid supplies, and made some attempt to exploit coprolite deposits. The prices of basic slag, superphosphate, ammonium sulphate and compounds were controlled. The control of the fertiliser industry lasted until 31st May, 1919.

The Inter-War Years

55. Within the next decade the leading suppliers in the fertiliser industry begin to emerge. The need for nitric acid and ammonium nitrate for munitions led eventually to the setting up of the first plant for the production of synthetic ammonium sulphate (see Chapter 3), and the history of the nitrogen section of the industry from this point onwards is largely the history of the interests of Imperial Chemical Industries Ltd. (I.C.I.) and its predecessors in fertilisers. Similarly, the history of the importation of potash is largely concerned with Potash Ltd. and its predecessors. So far as classes (*c*), (*d*) and (*f*) are concerned, although their history is not solely a matter of the development of Fisons Ltd. (Fisons), that company played an increasingly important part from 1929 onwards. The first organisation of the basic slag industry was represented by the setting up of British Basic Slag Ltd. (B.B.S.) (originally called British Basic Slag (Alberts' Successors) Ltd.) in 1917. Since 1935 Fisons has also played an important part in class (*e*). The history of the fertiliser businesses of these companies is dealt with in Chapters 3 to 6. In the following paragraphs we therefore deal principally with matters of common interest such as association activities and developments, and the Government's war-time and post-war controls, which affected all fertiliser suppliers in greater or lesser degree.

56. The fertiliser manufacturing trade after the 1914–18 war was organised broadly in two trade associations, the Fertiliser Manufacturers' Association Ltd. (F.M.A.) and the British Sulphate of Ammonia Federation Ltd. (B.S.A.F.). The F.M.A., incorporated in 1919 as the successor of two

earlier associations, represented primarily the superphosphate manufacturers, who alone were eligible for ordinary membership. These manufacturers were also engaged to varying extents in the manufacture of compounds and some also supplied ground rock as a fertiliser. Other manufacturers of chemical fertilisers, including "dry mixers" (i.e. traders who made compounds by mixing ingredients bought from other sources), were eligible for associate membership. I.C.I. was admitted as an associate member in 1934. In 1939 "dry mixers" were given most of the rights of ordinary members, and, in 1948, were admitted to full membership under the new Articles of Association.

57. The F.M.A. concerned itself with selling terms for its members' production of superphosphate and compounds, terms for their supplies of raw materials and measures for the protection of the home superphosphate industry. In regard to members' production there were internal discussions on prices and allowances, and negotiations with the National Association of Corn and Agricultural Merchants Ltd. and the Agricultural Wholesale Society on allowances or re-sale terms, with the railway companies on freight rates, and with non-members on terms of supply of fertilisers. The local sections included in the organisation of the F.M.A. were authorised to discuss prices and terms and to make recommendations which members were strongly urged to follow. No penalties were, however, imposed on dissenting members. On the raw material side there were discussions and negotiations with B.S.A.F. (see paragraph 61) and I.C.I. (or its predecessors) and with the United Potash Co. Ltd. (which until 1939 was the sole importer of West European potash) about the supply to members of ammonium sulphate and potash. From 1919 to 1922 the F.M.A. (which had distributed the phosphate rock imported by the Government during the war) purchased rock for its members, and subsequently it offered information and brokerage services.

58. Throughout the 1920s the F.M.A. made various attempts to counter the situation created by the sale of cheap foreign superphosphate in the United Kingdom. A number of agreements were made between 1923 and 1930 with various firms and groups, mainly in Holland, Belgium and France, to restrict exports to the United Kingdom to agreed quotas at fixed prices. These supplies were bought by the F.M.A. and allocated between its members. In 1921 the F.M.A. purchased a controlling interest in the Belgian company, Superphosphates Standaert, with the object of obtaining commercial intelligence and influencing prices in Belgium. The capital was furnished by a levy, based on their production, contributed by all but a few members of the F.M.A. The shares were subsequently transferred to the contributors but the Association continued to nominate directors and held control of the company. In 1930 the Association financed a new company for the production of sulphuric acid, Acides Standaert, which amalgamated with Superphosphates Standaert to form Acides et Superphosphates Standaert, S.A. in 1932. In 1926 the F.M.A. played an important part in the formation of the International Superphosphate Manufacturers' Association, the chief activity of which was to investigate the possibility of regulating the European superphosphate industry so that supply would balance demand. Serious negotiations for an international agreement began in 1928 but difficulties arose and they were abandoned in 1931.

59. Despite these efforts the trade of the superphosphate and compound producers remained generally depressed and unremunerative throughout the 1920s. Attempts to improve matters, principally by pressing the Government to impose a protective tariff on superphosphate imports, continued to be made by the F.M.A., but these were ineffective until, in 1932, an ad valorem duty of 10 per cent. was imposed under the Import Duties Act, 1932. The F.M.A. considered this insufficient and in 1934, after long negotiations, a duty of 20 per cent. was imposed. As a consideration the Import Duties Advisory Committee (I.D.A.C.) required the superphosphate manufacturers to keep their prices to 1934 levels, subject to such increases as might be justified by increases in manufacturing costs. A number of such increases in prices were in fact allowed between 1934 and 1939. The results of the tariff became apparent in a fall in imports of superphosphate from a round figure of 114,000 tons in 1931 to 14,500 in 1938.

60. Two other important developments in the organisation of the superphosphate and compound sections of the industry took place at the end of the 1920s. These were the acquisition by I.C.I. in 1928 of a controlling interest in a number of Scottish companies engaged in the manufacture of superphosphate and compounds and the marketing of agricultural requirements and the amalgamation in 1929 of three East Anglian producers to form the company now known as Fisons (see Chapters 3 and 4).

61. The principal developments in the nitrogenous section of the fertiliser industry during this period were as follows. The by-product producers of ammonium sulphate had been grouped in the Sulphate of Ammonia Association since 1914. In 1920 this was succeded by the B.S.A.F. which was formed to act as sole selling agent for its members. In 1923 Synthetic Ammonia and Nitrates Ltd., a subsidiary of Brunner Mond & Co. Ltd. which had begun production of synthetic ammonium sulphate at Billingham, became a member of the B.S.A.F., and in 1926 Nitram Ltd. was formed by Brunner Mond & Co. Ltd. to act as sole selling agent for the B.S.A.F. and to market other fertilisers to be produced at Billingham. In 1926 I.C.I. was formed to merge a number of companies, including Brunner Mond & Co. Ltd.; in 1927 it began the production of Nitro-Chalk, and in 1930 it took over the B.S.A.F. agency from Nitram Ltd. (In view of the closeness of the relationship between the B.S.A.F. and I.C.I. these arrangements and their developments are dealt with in Chapter 3.) Throughout this period the world productive capacity for nitrogen was in excess of demand. In the 1930s I.C.I. participated in an international nitrogen cartel (see paragraph 119). In 1935 the Government imposed a specific import duty of £4 per ton on ammonium sulphate, the manufacturers giving I.D.A.C. certain undertakings on prices.

62. Throughout the 1930s compounders were virtually dependent on I.C.I., as agent for the B.S.A.F., for supplies of one of their essential raw materials, ammonium sulphate, and the relationship was complicated when I.C.I., in 1931, produced its range of concentrated complete fertilisers (C.C.F.'s) based on ammonium phosphate. An agreement was made between I.C.I. and the F.M.A. in 1934 which regulated the terms for supplies of ammonium sulphate for mixing, the prices of certain compounds, and resale terms for I.C.I.'s fertilisers generally. The agreement and the developments, principally on Fisons' part, which led to its revocation in 1939, are described in paragraphs 195 to 198.

63. During this period supplies of potash were obtained principally from France, Germany and Spain. In 1926 a Franco-German cartel agreement was made, which was joined later by Spain and Poland. The principal importer in the United Kingdom from 1927 was United Potash Company Ltd. (see Chapter 5).

64. Basic slag was supplied during the inter-war period by a number of steel works. As already mentioned the first organisation of this section of the fertiliser industry is represented by the setting up of B.B.S. in 1917 (see Chapter 6). Supplies by this company and by others included slag of open-hearth and basic Bessemer origin until 1926, when the latter process was temporarily abandoned in the United Kingdom. The basic Bessemer process was re-introduced in 1935 by Stewarts and Lloyds Ltd., and by Richard Thomas & Co. Ltd. in 1938. Supplies from these companies were made, under agreement, to Corby Basic Slag Ltd., a subsidiary of Fisons (see Chapter 4).

65. During the inter-war period the Government took action on a number of matters affecting the fertiliser industry. The provisions of the Fertiliser and Feeding Stuffs Act, 1906, were revised and a new Act passed in 1926, following the report of a Committee of Enquiry and earlier reports by a joint committee on which the F.M.A. was represented. As already mentioned the prices of ammonium sulphate and superphosphate were controlled by the I.D.A.C. when rates of duty higher than 10 per cent. *ad valorem* were imposed on these fertilisers. Compounds containing ammonium sulphate and superphosphate were also subject to a measure of price control. The Ministry of Agriculture and Fisheries introduced a subsidy on lime and basic slag under the Land Fertility Act, 1937, and controlled the prices of both these products.

The 1939-45 War : Government Controls

66. From the outbreak of war in 1939 various measures were taken by the Government to control the production, prices, distribution and use of chemical fertilisers. The Government Departments responsible were the Ministry of Supply and, for certain matters, the Ministry of Agriculture and Fisheries, and two separate but connected organisations were set up : (*a*) the Fertiliser Control (later the Directorate of Fertiliser Supplies), which was responsible for all fertilisers and fertiliser raw materials other than nitrogenous fertilisers, (*b*) the Sulphate of Ammonia Control (later the Industrial Ammonia Control and finally the Directorate of Nitrogen Supplies), which was responsible for nitrogenous fertilisers and for ammonia whether for fertiliser or other uses.

67. The details of control of production and prices varied with the fertiliser and are set out below. Broadly, essential raw materials and some fertilisers were imported on Government account and stabilisation of prices was secured by issuing materials to the industry at fixed prices and paying subsidies to manufacturers to offset rising costs. Maximum prices were fixed by statutory orders. The distribution of fertilisers was generally maintained in the pre-war pattern by the Control of Fertilisers (No. 3) Order, 1940 (S.R. & O. 1940, No. 21) which required the registration of all producers and distributors of fertilisers and prohibited supply or procurement except through these registered channels. The scarcity of potash and

phosphate and the need to give priority to certain crops led to the introduction of a rationing scheme in July, 1941, under which the County War Agricultural Committees and the corresponding Scottish Committees were authorised to issue authority to farmers for the acquisition of certain fertilisers. Later, restrictions were imposed on the composition of compound fertilisers and on the size of package to be employed for certain materials, notably potash.

68. *Nitrogenous fertilisers.* The Government imported sodium nitrate from Chile and, to a lesser extent, ammonium phosphate from Canada. The more important steps were directed to increasing the home production of nitrogenous fertilisers: surplus ammonia from other works was sent to fertiliser factories, ammonium nitrate from explosives factories was at times used as a fertiliser and waste ammonia liquor was recovered. The principal Government measure was the installation of a factory at Prudhoe in 1942 which manufactured synthetic ammonia and ammonium sulphate. Prudhoe provided about 30 per cent. of the United Kingdom supply of ammonium sulphate during the later war years. The factory was built with the technical co-operation of I.C.I. which managed it as the Government's agent. Various limited increases in the price of ammonium sulphate were allowed in 1939 and 1940, but from then until 1950 the price was stabilised. This was secured in the main by subsidising the manufacturers who were credited at a flat rate with the amounts attributed to cost increases. Price control orders, made in 1940 and subsequently, prescribed early delivery rebates for supplies to farmers, and an additional early booking rebate—the Government Distribution Allowance—which was recoverable by the manufacturer from the Department; both kinds of rebate were designed to encourage purchases in the off-season. For sale to compounders a single rebate, the Government compound rebate, was prescribed. The cash prices quoted in the orders included delivery to the buyer's nearest station. Merchants' commissions were provided for.

69. I.C.I.'s costs in the early days of control rose less than those of other manufacturers of ammonium sulphate and until September, 1943, the company paid to the Ministry of Supply any excess profits, calculated by reference to its realisation on home sales of nitrogenous fertilisers in 1938–39, attributable to the 1940 price control orders and subsequent subsidies. The subsidy first given on ammonium sulphate was later extended to Nitro-Chalk, and also to C.C.F. In the later stages of control payments to I.C.I. were calculated to give a total yield of 10 per cent. on capital employed in its fertiliser business when working to full capacity.

70. *Potash.* Supplies of potash from Germany ceased at the outbreak of war and from France in May, 1940. Thereafter the Government drew supplies from Spain, North America, Palestine and the U.S.S.R. The arrangements made were mostly simple purchasing contracts but some financial assistance was given to a Palestine producer. United Potash Co. Ltd. ceased to trade at the beginning of the war and Potash Ltd., which was formed in November, 1939, had its shares vested in the Custodian of Enemy Property in 1940 (see paragraphs 229 to 231). Potash Ltd. did not trade on its own account but was appointed by the Board of Trade to act as its agent in procuring and marketing potash. Prices were held steady until 1940 when an Order was made fixing maximum prices ex port store.

71. *Superphosphate, ground rock phosphate and compounds.* The Government imported phosphate rock first from North Africa and then from the United States and other more distant sources, and calcium metaphosphate and triple superphosphate from the U.S.A., and, as already mentioned, ammonium phosphate from Canada. Supply of rock from North Africa was resumed in 1943. Procurement and distribution were looked after by the Fertiliser Control, with which the F.M.A., on behalf of the industry, worked in close co-operation. A pool was set up at the outbreak of war into which manufacturers of ground rock phosphate and superphosphate paid the part of their sales proceeds attributable to the additions permitted to pre-war prices and from which they received sums corresponding to their individual increases in material costs. From 1st July, 1942, rock was supplied to manufacturers at their individual pre-war prices but the pool continued to operate in respect of other materials. Payments, at a flat rate per ton, were also made to manufacturers from Government funds to cover other increases in costs. From 1941 cost investigations were made annually. The prices of materials issued from the pool, the other allowances and manufacturers' selling prices were determined with a view to providing a return of about 10 per cent. on capital employed for the industry generally. Subsidies on C.C.F. were paid to I.C.I. as part of the general arrangement made with that company (see paragraph 69).

72. In the early years of control maximum prices for superphosphates and compounds were expressed as permitted additions to the individual producers' pre-war prices. In October, 1943, a uniform maximum delivered price was laid down for superphosphate with provisions for early delivery rebates. For compounds provision was made for quoting delivered prices and early delivery rebates were introduced. Uniform maximum cash prices were prescribed for a group of " National " compounds representing certain standard combinations of nutrient elements which were introduced in the war years. These were determined by adding to the price of the straight ingredients an additional sum—called " bogey "—to cover mixing and certain other costs. Cash maximum prices were later prescribed for I.C.I.'s C.C.F. Maximum prices for other compounds continued to be prescribed by reference to those charged for similar products in a standard period.

73. *Basic slag.* The Ministry of Agriculture and Fisheries retained the responsibility for basic slag until 1941 when it passed to the Ministry of Supply. At the same time the subsidy to farmers, which had been paid under the Land Fertility Act, 1937, was withdrawn, in order to bring the price per unit of nutrient closer into line with that of other phosphatic fertilisers. A Government agency factory was opened at Llanelly and the Government gave assistance to provide plant elsewhere to grind all the available slag. In 1943 the Basic Slag Producers Association, comprising representatives of all the producers, was set up to facilitate negotiations with the Government.

74. The Ministry of Supply introduced in 1941 a system of maximum prices for basic slag on a national delivered basis. These prices were generally at pre-war levels and to offset increases in cost payments were made by the Ministry to the producers. For 1941–42 and 1942–43 the payments were calculated to enable each producer to obtain the " net proceeds "

per ton (after deducting costs of grinding, packing and transport, and representing both raw slag value and profit on sales of ground slag) which he had had in a twelve months period ending in 1941. In 1943, both to meet the steel makers' claim for increased remuneration to offset the increased cost of producing raw slag and to encourage the production and marketing of slags with a high content of soluble P_2O_5, the individual net proceeds basis was replaced by a formula in which profits on grinding and sale were distinguished from the raw slag value. The latter was set out in a "raw slag scale" which, as first settled, was at the rate of 5d. per ton for each unit of P_2O_5 plus 10d. for each citric soluble unit. The difference between the producer's price calculated from the scale and his realised (controlled) price continued to be paid by the Ministry. The Ministry made some investigation of the costs of grinding slag but it was not considered practicable to relate profits on basic slag to total costs of production. The profits of steel undertakings as a whole were in any event separately controlled.

Post-war Development and Decontrol

75. The Government control of fertilisers lasted for some time after the end of the war. The control of acquisition of fertilisers by farmers was retained generally until July, 1946, and in respect of fertilisers containing potash until July, 1947. The provisions first applied by the Control of Fertilisers (No. 3) Order, 1940, which had generally perpetuated the pre-war pattern of supply, were not rescinded until 27th January, 1949. Government trading in imported fertilisers and raw materials continued until July, 1952, basic slag from the Continent having been added to these in 1946. In 1950 and 1951 the subsidies paid to the fertiliser manufacturers were brought to an end in two stages, and general increases in controlled prices were allowed in consequence. The cost of stabilisation had risen from £1,585,000 in 1940–41 to £14,596,000 in 1949–50, equivalent to about 10 per cent. and 40 per cent. respectively of farmers' expenditure on fertilisers. Deliveries of fertilisers fell from July, 1951. Some months later the Ministry of Agriculture and Fisheries started to pay subsidies direct to farmers on their purchases of fertilisers (see paragraph 31). In 1953 the price control of fertilisers generally was brought to an end. (For the particular case of I.C.I. see paragraph 77.)

76. The principal trading developments in the period of transition from Government control—roughly from 1952 to 1954—were as follows. *Ammonium sulphate.* I.C.I. bought the Prudhoe factory from the Government in November, 1954. *Potash.* Government stocks of potash were sold through Potash Ltd., the former agent, and licences were granted on request for importation from a number of countries—West Germany, France, Spain, East Germany, Poland, Russia and Israel. *Phosphate rock, superphosphate and compounds.* From 1945 to 1952, the F.M.A. had acted as agent for the distribution of the rock and fertilisers imported by the Government. One section of opinion in the trade would have welcomed the continuance of centralised Government purchasing; another (including Fisons) would have preferred complete freedom for individual purchase. Eventually it was agreed to adopt a compromise solution on lines suggested by Fisons, and in 1952 the Phosphate Rock Agency Ltd. (P.R.A.) was set up to negotiate purchases of rock and shipping freights on behalf of the

fertiliser industry (see paragraphs 99–101). In 1948 those members of the F.M.A. who were superphosphate manufacturers set up a new association, the Superphosphate Manufacturers' Association Ltd. (S.M.A.). At the same time the F.M.A. revised its constitution and admitted dry mixers to full membership. *Basic slag.* The Basic Slag Producers Association, through its leading members, Fisons, B.B.S., and Scottish Agricultural Industries Ltd. (S.A.I.), acted as agent for the distribution of slag imported by the Government from 1946–47 to 1951–52, and took over its procurement for the two following years. B.B.S. and the Association withdrew from this arrangement after 1953–54.

77. The following developments in the final stages of price control are of particular interest. *Nitrogenous fertilisers.* From 1949 to February, 1955, I.C.I. accepted a system of non-statutory control under which it was to have a profit of 10 per cent. on capital employed in respect of its home sales of its various fertilisers, but with some modification if output fell below 80 per cent. of the capacity available to meet home requirements. Maximum prices for ammonium sulphate generally were fixed by the Government from the end of price stabilisation in July, 1951, to the end of formal price control two years later by reference to a weighted average cost for the higher and lower cost producers. Under the home price equalisation scheme, operated by B.S.A.F. for members and non-members alike, the "excess" profits of the lower cost producers (I.C.I. and Prudhoe) were transferred to the higher cost producers (the by-product manufacturers and Nitrogen Fertilisers Ltd.) proportionally to individual sales. Non-members participated in the scheme until July, 1954, and it was not abandoned as far as B.S.A.F. members were concerned until July, 1955. *Potash.* When Government buying came to an end in 1952 maximum selling prices (c.i.f. United Kingdom port) were calculated by taking f.o.b. or f.a.s. prices at Continental ports, and adding thereto freight and certain other costs and a 1 per cent. margin to cover Potash Ltd.'s office expenses, advisory service and profit. *Other fertilisers.* Price control arrangements continued broadly on the lines already indicated. Some increase in the maximum price for straight superphosphate was allowed by the Government in 1946–47 and compound prices were reduced at the same time. Later attempts by the manufacturers to get Government approval for higher prices for superphosphate, which they said was in effect being subsidised by their compound prices, were not successful. The raw slag valuation scale was revised in 1949.

78. At the end of price control in 1953 the fertiliser industry generally was charging common prices and, except in the cases of potash and, in Scotland, of compounds, was quoting these to include delivery to the farmer's nearest station. The Agricultural Departments and the Ministry of Materials were generally anxious that the transition to trading free of price control should be smooth and occasion as little embarrassment to the agricultural community as possible, and that prices should remain reasonably stable. At the request of the Agricultural Departments, which found the prevailing arrangement convenient for subsidy administration, the Ministry of Materials asked for an assurance that long notice should be given if it was ever proposed to abandon the national delivered price basis. A similar assurance was obtained from Potash Ltd. in respect of its common price ex port. Some members of the F.M.A. and S.M.A. interpreted the Government's

wishes as pointing to the desirability of continuing some form of price regulation but there was ultimately general agreement to have no part in price fixing. The Associations therefore accepted the views put forward by Fisons and others, considering that by asking their more prominent members to give a lead on prices the Government's wishes would be adequately met.

79. The S.M.A. ceased to make recommendations on selling terms and arrangements in 1953. The F.M.A. continued until June, 1956, to consider its sections' views on selling terms such as collection allowances, merchants' terms and early delivery rebates and to make recommendations on the latter. The F.M.A. in the same period negotiated with I.C.I. about the terms of supply of ammonium sulphate to members. In June, 1956, both Associations passed resolutions rescinding all present or past recommendations which might be registrable under the Restrictive Trade Practices Act, 1956. The Basic Slag Producers Association continue to discuss cost movements, rebates, allowances and other trading terms until June, 1956. The Association recommended a scale of road haulage allowances to customers taking delivery of slag from works in their own vehicles. In June, 1956, the Association rescinded all recommendations, express or implied, which would be registrable under the Restrictive Trade Practices Act.

II. The Present Organisation of the Fertiliser Industry

Producers and Importers

80. The primary suppliers of chemical fertilisers in the United Kingdom comprise approximately forty producers in class (*a*), five importers in class (*b*), fourteen producers in class (*c*), nineteen producers in class (*d*), twelve producers in class (*e*) (counting the individual steel companies) and about one hundred producers in class (*f*). The producers of superphosphate in class (*c*) also make compounds in class (*f*), using some of their superphosphate for this purpose, while most of them also produce ground rock phosphate in class (*d*), and a number of steel works produce, as by-products, both ammonium sulphate in class (*a*) and basic slag in class (*e*). Practically the only producers with interests in more than three classes are Fisons and I.C.I. (with its subsidiary S.A.I.). One result of this specialisation is that compound manufacturers are now the principal customers of the producers or importers in classes (*a*), (*b*) and (*c*). Another feature of the fertiliser industry in this country is the close connection between compounding and merchanting, most compounders carrying on a merchant business in straight fertilisers and also, to varying extents, in compounds made by other manufacturers. The organisation of the suppliers, class by class, is summarised in the following paragraphs. The organisation and activities of the leading suppliers, viz. I.C.I., Fisons, Potash Ltd. and B.B.S., are described in Chapters 3 to 6.

Class (a): Nitrogenous Fertilisers

81. Ammonium sulphate is produced in the United Kingdom by I.C.I. and Nitrogen Fertilisers Ltd. by synthetic processes, and by thirty-eight gas works, coke producers, steel works and smelters as a by-product. All but five of the by-product producers are members of the B.S.A.F., for which I.C.I.—also a member—acts as sole selling agent. Sales of ammonium sulphate in the home and export markets by members of the Federation

in 1957–58 amounted to 1,096,000 tons. *I.C.I.* produced 812,000 tons during the same period, of which 695,000 tons were sold through the Federation and the balance used internally at Billingham in the manufacture of C.C.F.'s. Sales by producers who were not members of the Federation amounted to about 60,000 tons. These producers were:

(1) *Nitrogen Fertilisers Ltd.* This company was formed in 1937 by Fisons Ltd. and the West Norfolk Farmers' Manure & Chemical Co-operative Company Ltd., and manufactures synthetic ammonium sulphate (see paragraph 196). Fisons owns three-quarters of the share capital and the other company one-quarter; ammonium sulphate is supplied to each in proportion to its shareholding.

(2) The following *by-product* producers: *The South Eastern Gas Board (Phoenix Works)** and the *Belfast Corporation Gas Works*; *Richard Thomas & Baldwins Ltd. (Redbourn Works)*† and *John Lysaght's Scunthorpe Works Ltd.* (steel producers); and *The National Smelting Company Ltd.* (zinc smelter). The output of John Lysaght's Scunthorpe Works and Richard Thomas & Baldwins' Redbourn Works is marketed by E. Nickerson & Co. Ltd., Grimsby, and that of The National Smelting Company by Consolidated Zinc Corporation (Sales) Ltd.

82. Sodium nitrate is imported by the Nitrate Corporation of Chile Ltd. (N.C.C.), and the bulk of these supplies are for fertiliser use. The company was incorporated on 10th July, 1930, under the name "Chilean Nitrate Producers Association (London) Ltd." Since 1932 the N.C.C.'s main function has been to act as agent of the Corporacion de Ventas de Salitre y Yodo de Chile for the sale in Europe and Egypt of Chilean nitrate of soda and Chilean "potash nitrate". From 1940 to 1952 the N.C.C. acted as agent for the Government's imports of sodium nitrate. Sales of Chilean sodium nitrate for fertiliser purposes by the N.C.C. in the United Kingdom in the fertiliser years 1955-56, 1956-57 and 1957-58 amounted to 16,117 tons, 9,000 tons and 8,308 tons respectively, at an average net sales value of £25 to £26 per ton. Almost all the N.C.C.'s fertiliser sales are to agricultural merchants. A very small part of its business is with nurseries and the horticultural trade.

83. Ammonium nitrate is not supplied in the Unitel Kingdom for use as a fertiliser or, except in experimental quantities, for the production of fertilisers. It is, nevertheless, made by a number of fertiliser manufacturers who mix it with other materials. Thus it is the active ingredient in Nitro-Chalk (and also in Nitra-Shell)—see paragraph 84. It is also now a constituent of some of the concentrated compounds made by Fisons.

84. Nitro-Chalk is manufactured only by I.C.I. Sales in 1956–57 and 1957-58 amounted to 433,211 tons and 440,139 tons respectively. Although there are now some similar products on the market, none of these is covered by our reference. Until recently these have all been imported from the Continent, the principal one being Nitra-Shell. The Shell Chemical Co. Ltd. is

* The S.E. Gas Board was a member of the B.S.A.F. in respect of its Waddon Works until production there ceased.

† Richard Thomas & Baldwins Ltd. is a member of the B.S.A.F. in respect of production at Ebbw Vale.

now manufacturing Nitra-Shell in the United Kingdom, though some of its supplies of the product are still imported.

Class (b): Potash Fertilisers

85. The United Kingdom is entirely dependent on imports for its potash supplies, whether for fertiliser or other use. The principal sources are France (Alsace), West Germany, Spain and East Germany. Imports are also made from Russia and Israel. There are large and important deposits in North America but supplies to the United Kingdom from this source have only been made recently and in small quantities. The following figures show the production and consumption of potash* in terms of K_2O content, in France, West Germany and Spain, in recent years, together with the exports from those countries:

	'000 metric tons K_2O		
	France	W. Germany	Spain
Production			
1955–56	1,207	1,666	216
1956–57	1,308	1,706	240
Consumption			
1955–56	581	847	71
1956–57	580	878	92
Exports			
1955–56	564	728	141
1956–57	668	744	142

Source: O.E.E.C. Report "Fertilisers: Production, Consumption, Prices and Trade in Europe. 7th Study 1955–58".

As will be seen, these producing countries export roughly half of their production. It appears from other O.E.E.C. figures that two of the producing countries, France and West Germany, are by far the largest consumers in O.E.E.C., while the United Kingdom is the largest O.E.E.C. importer from the producing countries. United Kingdom imports of potash from sources other than Western Europe (East Germany, Israel and Russia) in 1957-58 amounted to about 130,000 tons of material, by far the larger part coming from East Germany.

86. The principal importer is *Potash Ltd.* which draws supplies from France, West Germany and Spain (see Chapter 5). The other importers are: *Propane Fertilisers Ltd.* This company was set up as a subsidiary of the Propane Company Ltd. in 1954 with a capital of £1,000. It held the United Kingdom agency for the selling organisation of the East German potash producers, Deutscher Inner und Ausserhandel Bergbau, in 1953 and again since March, 1956. In the intervening seasons East German sales were in the hands of another company, Deutsche Waren-Vertriebsgesellschaft m.b.H. The United Kingdom agent at that time was a subsidiary of The Cookson Produce & Chemical Company Ltd., namely *The Cookson Produce & Chemical Co. (Fertilisers) Ltd.*, which was established in 1954 for the purpose

* The potash salts to which these figures relate consist principally of potassium chloride, with some potassium sulphate.

of this agency business. *M. W. Hardy & Co. (Mercantile) Ltd.* has been sole distributor for U.S.S.R. potash in the United Kingdom and the Irish Republic since 1st January, 1958, under an agreement made with the Russian State Trading Organisation, Sojuspromexport. In 1956 and 1957, Russian potash supplies were handled by *Stratton Chemicals Ltd.*, as agents for Stemmler-Imex N.V., Amsterdam, who then held the sole foreign concession for fertiliser potash from the Russian organisation. *The Dead Sea Works Ltd.*, an Israel company controlled by the Government of that country, supplies Israel potash direct to United Kingdom customers. In recent years there has also been some sale from Board of Trade stocks, originally imported from various sources.

87. Sales of potash in the United Kingdom in recent years, other than from Board of Trade stocks, have been as follows:

Type	Supplier	Origin	1955–56	1956–57	1957–58
			Tons	Tons	Tons
Potassium chloride.	Potash Ltd. ...	West Europe ...	419,443	443,944	431,775
	Cookson	East Germany ...			
	Propane	East Germany ...			
	Stratton	U.S.S.R.... ...	79,076	72,071	111,766
	Dead Sea Works ...	Israel			
	Hardy	U.S.S.R.... ...			
Potassium sulphate.	Potash Ltd. ...	West Europe ...	16,125	15,771	15,459
	Cookson	East Germany ...	380	400	800
	Propane	East Germany ...			
Kainite ...	Potash Ltd. ...	West Europe ...	—	13,517	11,324
	Cookson	East Germany ...	26,931	21,000	21,000
	Propane	East Germany ...			

Class (c): Single and Triple Superphosphate

88. There are fourteen* producers of single superphosphate, the largest being Fisons and the next S.A.I. Supplies in recent years have been as follows:

	1956-57 *Tons*	*1957-58* *Tons*
Fisons	109,579	95,315
S.A.I.	57,100	48,942
Others	105,135	110,904

There are only three producers who manufacture triple superphosphate for sale, viz. Fisons, The Farmers' Company Ltd. and The Eaglescliffe Chemical Company Ltd. Supplies in recent years have been as follows:

	1956-57 *Tons*	*1957-58* *Tons*
Fisons	29,218	25,897
The Farmers' Co. Ltd.	864	792
The Eaglescliffe Chemical Co. Ltd. ...	—	168

All these producers use some of their single and triple superphosphate production in their own compounds. The activities of *Fisons* and *S.A.I.*

* There were fifteen prior to 1st July, 1958, when two companies amalgamated.

are described in Chapters 4 and 3 respectively. The seven next largest producers supplied single superphosphate in quantities ranging from approximately 26,000 to 6,000 tons in 1957–58. They are briefly described, together with The Farmers' Company Ltd., in alphabetical order in the next paragraph.

89. *The Eaglescliffe Chemical Company Ltd.*, Eaglescliffe, Stockton-on-Tees, owned by Associated Chemical Companies Ltd., was incorporated in 1938 but the business was founded in 1833. It manufactures single superphosphate, ground rock phosphate and compound fertilisers, and also produces sulphuric acid mainly for its own use in superphosphate production. Since the end of 1957 the company has manufactured triple superphosphate for use in its concentrated compounds and has also sold a small quantity. Its triple superphosphate is made in a standard Broadfield den and using purchased phosphoric acid. It has a relatively small merchanting business in other producers' fertilisers. *The Farmers' Company Ltd.*, Brigg, was founded in 1874 and manufactures compounds (its principal production), single and triple superphosphate, a very small quantity of ground rock phosphate, and sulphuric acid and phosphoric acid for its own use. It has a merchanting business in other producers' fertilisers. *R. & J. Garroway Ltd.*, Glasgow, was founded in 1817. It manufactures single superphosphate, compounds, ground rock phosphate and, for its own use, sulphuric acid. It has some merchanting business in other producers' fertilisers. In the past it has had trading agreements with S.A.I. and, from 1947 to 1953, a market sharing agreement with S.A.I. and Fisons applying to fertilisers derived from phosphate rock (see paragraph 148). *Lawes Chemical Co. Ltd.*, Barking, was incorporated in 1872 but the business was founded about 1841 by Sir John Bennet Lawes, who first patented a process for manufacturing calcium superphosphate. Its principal production at the present day is of compound fertilisers, and since 1957 these have included concentrated compounds incorporating home-produced triple superphosphate and imported diammonium phosphate, home-produced supplies of the latter not being available. It also produces single superphosphate, sulphuric acid for its own use and a little ground rock phosphate. It has a relatively small merchanting business in other producers' fertilisers. *Richardsons Chemical Manure Co. Ltd.*, Belfast, was founded in 1897, and is the largest fertiliser producer in Northern Ireland. It manufactures single superphosphate, compounds, ground rock phosphate and " Semsol " (a mixture of single superphosphate and ground rock). It also manufactures sulphuric acid for its own use and has a merchanting business in other producers' fertilisers. *The Ulster Manure Co. Ltd.*, Belfast, incorporated in 1877, is an associate of Richardsons Chemical Manure Co. Ltd. Its principal fertiliser production is in compounds but it also manufactures single superphosphate and sulphuric acid for its own use. It has a merchanting business in other producers' fertilisers. *Edward Webb & Son (Stourbridge) Ltd.*, Stourbridge, was incorporated in 1914. It manufactures compound fertilisers, single superphosphate and ground rock phosphate ; it also manufactures sulphuric acid for its own use. It has a merchanting business in other producers' straight fertilisers. *The West Norfolk Farmers' Manure & Chemical Co-operative Co. Ltd.*, King's Lynn, now trading as West Norfolk Fertilisers, was incorporated under its present name in 1920, the original business being founded in 1872. About one-third of the share capital has since been

acquired by the Co-operative Wholesale Society. The company manufactures single superphosphate, ground rock phosphate and compounds; it also manufactures sulphuric acid for its own use and triple superphosphate for incorporation in its compounds, but not for sale. It has a large merchanting business in other manufacturers' fertilisers. It also has a one-quarter interest in Nitrogen Fertilisers Ltd. (see paragraph 81).

Class (d): Ground Rock Phosphate

90. Ground rock phosphate is produced and supplied by Fisons, S.A.I. and seventeen other firms. Supplies are made both for straight use and for compounding, the former, with which the reference is concerned, predominating. Supplies for both uses in recent years were as follows:

	1956-57 *Tons*	*1957-58* *Tons*
Fisons	10,312	9,229
S.A.I.	11,834	10,183
Others	16,696	16,690

The activities of *Fisons* and *S.A.I.* are described in Chapters 4 and 3 respectively. Of the other producers the largest, with annual sales (for all purposes) ranging from 2,000 to 4,000 tons, are *The Eaglescliffe Chemical Co. Ltd., R. & J. Garroway Ltd.* and *E. J. Jobling-Purser and Co. Ltd.* The first two companies are described in paragraph 89 above. *E. J. Jobling-Purser and Co. Ltd.*, Newcastle-on-Tyne, was incorporated in 1948 when an existing business was taken over. It produces ground rock phosphate, potassic mineral phosphate and a mixture of ground rock phosphate and a nitrogenous fertiliser. It has some merchanting business in granular compounds made by other manufacturers.

Class (e): Basic Slag

91. In 1957-58 about 84 per cent. of the basic slag used as fertiliser in the United Kingdom was produced in this country, the remainder being imported from France, Belgium and Luxemburg. The home producers of raw slag are twelve steel companies, but not all of these carry out the further process of grinding the slag which is necessary for its application as a fertiliser. Most of the ground slag supplied is sold through *Fisons, British Basic Slag Ltd.* (*B.B.S.*) and *S.A.I.* Fisons' home-produced supplies are obtained from its subsidiary, Corby Basic Slag Ltd. Continental basic slag is obtained from the Syndicat Belge des Scories Thomas, Brussels, and the Société Nationale Pour la Vente des Scories Thomas, Paris; the selling agent in the United Kingdom for these two suppliers is the Diamond Fertiliser and Chemical Co. Ltd. Supplies are made through Fisons and S.A.I. in Great Britain and through a number of fertiliser manufacturers and merchants in Northern Ireland. The activities of Fisons, B.B.S. and S.A.I. are described in Chapters 4, 6 and 3 respectively. Small quantities of ground slag are supplied independently by *Richard Thomas & Baldwins Ltd.**

* The great bulk of this company's supplies go to Corby Basic Slag Ltd.

and the *Stanhope Lime & Limestone Company Ltd.* Supplies in recent years have been as follows :

	1956-57 Tons	*1957-58 Tons*
Fisons	309,759	304,863
B.B.S.	278,672	283,564
S.A.I.	115,772	133,063
Others	27,986	37,569

Class (f) : Compound Fertilisers

92. The manufacturers of compound fertilisers include Fisons, I.C.I., S.A.I. and about one hundred other firms. Supplies in recent years have been as follows:

	1956-57 Tons	*1957-58 Tons*
Fisons	995,909	1,017,853
I.C.I. & S.A.I.	439,041	495,274
Others	819,866	853,633

The activities of *Fisons* are described in Chapter 4 and of *I.C.I.* and *S.A.I.* in Chapter 3. The nine next largest producers supplied compounds in quantities ranging from approximately 28,000 to 113,000 tons in 1957–58. They include *The Farmers' Co. Ltd., Lawes Chemical Co. Ltd., Richardsons Chemical Manure Co. Ltd., The Ulster Manure Co. Ltd., Edward Webb & Son (Stourbridge) Ltd.* and *West Norfolk Fertilisers,* whose activities are described in paragraph 89 above, and the following. *The Farmers' Fertiliser Co. Ltd.,* Royston, established in 1864, manufactures compound fertilisers and was formerly a producer of superphosphate. It has a merchanting business in other producers' straight fertilisers. *The Humber Fishing & Fish Manure Co. Ltd.,* Hull, was in existence as a private company prior to 1924 when the present company was incorporated. It produces compound fertilisers, all of which are based on a naturally composted fish foundation. It has some merchanting business in other producers' fertilisers. *The Northern Agricultural & Lime Co. Ltd.,* Aberdeen, was formed by the amalgamation in 1930 of The Aberdeen Lime Co. Ltd., founded in 1837, and The Northern Agricultural Co. Ltd., founded in 1854, and adopted its present name in 1941. It produces compound fertilisers and ground rock phosphate. It also has a merchanting business in other producers' fertilisers.

Producers' Associations

93. The activities of the British Sulphate of Ammonia Federation Ltd., to which the great majority of the producers of ammonium sulphate belong, are described in Chapter 3. The other associations of fertiliser manufacturers are the Superphosphate Manufacturers' Association Ltd., the Fertiliser Manufacturers' Association Ltd., the Basic Slag Producers Association and the Association of British Organic Fertilisers Ltd. A number of superphosphate and compound manufacturers are also members of the Phosphate Rock Agency Ltd. whose activities are described in paragraphs 99 to 101 below.

The Superphosphate Manufacturers' Association Ltd.

94. The S.M.A. was set up in 1948 by those members of the F.M.A. who were superphosphate manufacturers (see paragraph 76). Membership of the S.M.A. is restricted to manufacturers of superphosphate as such, producers of other water soluble phosphatic fertilisers not being eligible. Its members now include all the fourteen United Kingdom superphosphate producers.* All these members are also producers of compounds. The Association collects on behalf of the Board of Trade statistics of its members' production, disposals and stocks of superphosphate and raw materials and circulates this and other information to members, and represents members as necessary in negotiations and discussions with Government Departments and other bodies. The S.M.A. has close links with the F.M.A., which provides secretarial services and to which its members also belong. It has taken over the F.M.A.'s membership of the International Superphosphate Manufacturers' Association and its shareholding in Acides et Superphosphates Standaert (see paragraph 58).

The Fertiliser Manufacturers' Association Ltd.

95. Since 1948 (see paragraph 76) the F.M.A. has been primarily concerned with the interests of compound manufacturers. It now has a membership of sixty-one producers in the United Kingdom,* including the manufacturers of superphosphate who also belong to the S.M.A. All companies named in paragraph 92 are members of the F.M.A. The F.M.A. has a Council, which is the governing body, and local sections. The sections provide the means by which members may state their views and make representations to the Council and, under the Council, they enjoy a certain degree of autonomy. Applications for membership are considered by the Council; normally all bona fide manufacturers of compound fertilisers containing phosphate are eligible. The principal activities of the F.M.A. are the collection and circulation to members and Government Departments of statistics relating to the supply and production of compound fertilisers and of certain raw materials used in their production; the representation of members in negotiations with Government Departments, other trade organisations and farmers; public relations work; the provision of information to individual members; and the organisation of Section meetings. There is close contact between the F.M.A. and the Ministry of Agriculture, Fisheries and Food, and discussions on the make-up of compound fertilisers and matters arising from the statutory requirements of the Fertiliser and Feeding Stuffs Act and Regulations are now taking place.

The Basic Slag Producers Association

96. The B.S.P.A. was formed in 1943. The present members are Fisons, B.B.S., S.A.I. and Richard Thomas & Baldwins Ltd., i.e. all the United Kingdom suppliers except the smallest. The objects of the Association are to provide a medium for co-operation between members on matters of common interest, to collect and circulate information on matters affecting the industry, and to represent its members, as necessary, in negotiations with Government Departments and other bodies interested in the production of basic slag and in agriculture.

* There are also three members in the Irish Republic.

The Association of British Organic Fertilisers Ltd.

97. The Association of British Organic Fertilisers Ltd. was formed in 1940. The principal interest of its members lies in the distribution and importation of purely organic fertilisers. A number of its members also belong to the F.M.A. Of its other members only half-a-dozen now make compounds of the kinds included in the reference.

Phosphate Rock Supplies and the Phosphate Rock Agency Ltd.

98. We conclude this survey of the organisation of the fertiliser producers with a note of the arrangements for importing phosphate rock. The United Kingdom depends largely for its supplies of phosphate rock on the important deposits in Morocco, Tunisia and Algeria. Supplies are also obtained from Nauru in the Oceanic Islands, and on occasion from the United States and other sources. In recent years sales have been made from Board of Trade stocks, originally obtained from North Africa and Nauru. Moroccan rock contains 75 to 77 per cent. tricalcium phosphate, Tunisian and Algerian 65 to 68 per cent. and Nauru 83 per cent. The output of the North African mines is sold by the Comptoir des Phosphates de l'Afrique du Nord; supplies from Nauru are obtained through the British Phosphate Commissioners. It is understood that, as a matter of general policy, the Comptoir des Phosphates expects each country to take some of its rock supplies in the lower grades and that, grade for grade, there is no substantial difference in the prices charged to the various European countries.

The Phosphate Rock Agency Ltd.

99. The P.R.A. was set up in 1952 to handle the procurement and distribution of phosphate rock when imports on Government account came to an end (see paragraph 76). The original membership comprised all the users of phosphate rock in the fertiliser industry. The Agency centralised the purchasing of all rock required for fertilisers until July, 1955, when Fisons, I.C.I. and S.A.I. withdrew from the purchasing arrangements but remained as associated charterers. It appears that, with one exception, the other users of rock still obtain their requirements through the P.R.A.

100. The P.R.A.'s functions are to "purchase or otherwise obtain from any part of the world supplies of phosphate rock or any other commodity* whether in its raw or natural state either as agents for, or with a view to supplying the demands of the Members . . ." and "to arrange for the insurance and transport" of the commodities purchased. Its members undertake to buy phosphate rock only through the P.R.A. and to use it solely for fertiliser production. Each member enters into a contract with the P.R.A. for his annual requirements of rock and, on the basis of the combined tonnage, the P.R.A., after reviewing the world supply position and freight situation, negotiates its annual contracts. So far these have been placed with the Comptoir des Phosphates and the British Phosphate Commissioners. The P.R.A. obtains the greater part of its requirements from the Comptoir and is given an "invoice rebate". It advises the Comptoir of the extent of its purchases from other sources but the amount of the latter is not now written into the contract with the Comptoir, as it was until two years ago, as a condition of the rebate terms. There is provision for the revision of

* The phrase was added in 1955 but no other commodity has in fact been purchased.

prices at the half year. The P.R.A. is a non-profit-making body, and sells to members at the f.a.s. price which it pays to its suppliers. Both for purchases from the Comptoir and from the British Phosphate Commissioners, the price per grade is the same to each member. The P.R.A. negotiates all shipping requirements and each member pays the negotiated market rate for a particular shipment regardless of the quantity of rock he may take from the cargo. There is no scheme for the pooling or equalising of freight. The cost of insurance and of delivery from port to works is the responsibility of each individual member.

101. The associated charterers, Fisons, I.C.I. and S.A.I., negotiate their own contracts for purchase of phosphate rock direct with the Comptoir and the British Phosphate Commissioners (see Chapters 9 and 10) but use the shipping and chartering services provided by the P.R.A., the arrangements as to freight and other charges applying to them as to ordinary P.R.A. members. It appears that generally fertiliser manufacturers in the United Kingdom, whether buying through the P.R.A. or independently, pay substantially the same f.a.s. price per grade of phosphate rock, and that, in the case of supplies from the Comptoir des Phosphates, this is the lowest European price.

The Distributors of Fertilisers

102. The consumers of fertilisers in classes (*a*), (*b*) and (*c*) include the manufacturers of compounds in class (*f*). The latter, except in so far as they make their own materials, normally buy direct from manufacturer or importer. Most fertilisers are distributed to the ultimate consumers, the farmers, by agricultural merchants and, to a smaller but still considerable extent, by agricultural co-operative societies. Generally the larger producers and importers, with the exception of S.A.I., supply only through these channels.* Producers who, like S.A.I., have merchanting businesses, sell both to farmers and to merchants. Some smaller producers sell to farmers only. Fertilisers for the use of horticulturists and amateur gardeners are also sold through retail shops.

Agricultural merchants

103. The trade of the typical agricultural merchant includes the buying and selling of agricultural produce, such as home-grown grain and pulse, and selling seeds, animal feeding stuffs and fertilisers. Many merchants are manufacturers of feeding stuffs and some of compound fertilisers. The merchant is a feature of the agriculture scene in this country and has a close relationship with the farmer ; he is frequently called upon for technical assistance and credit. There are about 2,800 agricultural merchants in the United Kingdom and the majority of them—about 2,500—are members of the National Association of Corn and Agricultural Merchants Ltd. which was formed in 1917 and represents them generally in negotiations with other bodies. In recent years some merchants have developed services for applying fertilisers under contract. This is not a general activity but is tending to grow each year. There are also agricultural contractors not in the merchanting business ; the National Association of Agricultural Contractors represents some 2,000 contractors in the United Kingdom, of whom about 300 undertake the application of fertilisers.

* A minor exception on the part of Fisons is described in paragraph 220.

Agricultural co-operative societies

104. Agricultural co-operative societies are farmer-owned organisations, which virtually cover the whole of the country, most farmers being members of at least one of them. They are usually classified as requirement societies, service societies and marketing societies, according to their activities, but many societies are multi-purpose. "Requirement" activities include the buying of fertilisers for re-sale to members. Most societies are now members of one of the national central organisations, viz., the Agricultural Central Co-operative Association Ltd. (A.C.C.A.) in England, and the respective Welsh, Scottish and Ulster Agricultural Organisation Societies in the other parts of the United Kingdom. These bodies have all been founded during the present century. Their functions are to give advice and service to members in respect of organisation, development, marketing and publicity, to represent them in negotiations with other bodies and to look after their interests generally. They have no trading activities.

105. Formerly a considerable number of agricultural co-operative societies belonged to the Co-operative Union Ltd., the central organisation of the consumer co-operative societies, but this is now exceptional. Some ninety-seven agricultural co-operative societies, including members of the A.C.C.A., are members of the Co-operative Wholesale Society Ltd. (C.W.S.). The C.W.S. and the Scottish Co-operative Wholesale Society Ltd. (S.C.W.S.) have an extensive trade in fertilisers, feeding stuffs and other farm requisites and they also own and manage a number of farms. The C.W.S. supplies fertilisers for re-sale both to member and non-member societies while the bulk of the S.C.W.S.'s fertiliser trade is with farmers through its own agricultural sections or its subsidiary company, James Wyllie & Sons (Grain Merchants) Ltd. The C.W.S. does not manufacture fertilisers, but it holds about one-third of the share capital of the West Norfolk Farmers' Manure and Chemical Co-operative Company Ltd. (West Norfolk Fertilisers—see paragraph 89) and four C.W.S. directors are also directors of the company. James Wyllie & Sons (Grain Merchants) Ltd. manufactures compound fertilisers in powder form. A few other societies also manufacture compounds. The S.C.W.S. formerly manufactured granular compound fertilisers. Production ceased and the plant was sold to S.A.I. in 1956 (see paragraph 150).

106. Agricultural co-operative societies buying fertilisers for re-sale are commonly given the same terms, discount or commission as agricultural merchants by manufacturers and importers. Societies sell to members and, in many cases, to non-members as well. The former, as shareholders of the society, usually obtain a bonus or dividend on purchases. The C.W.S. obtains large buyers' terms from Fisons and overriding wholesale terms from other manufacturers. From 1937 to 1955 the C.W.S. obtained overriding commissions from I.C.I. on fertilisers invoiced through it to affiliated societies and in return took 'del credere' risks.

General Trading Arrangements

107. For sale to farmers fertilisers are normally packed in 1 or 2 cwt. bags, but compounders usually buy in bulk. Special containers, from which the fertiliser may be applied straight to the soil, are sometimes used for basic slag. Fertilisers are delivered by rail or road or, where convenient in the case of bulk deliveries, by water; delivery by road may be made

by the manufacturers, but in many cases fertilisers are collected at the works by merchants or other customers using their own transport. Although farmers' purchases are usually invoiced through a merchant, they are frequently delivered direct from the works or port to the farmer or his nearest station. The extent to which merchants or co-operative societies store fertilisers and deliver from stock varies.

108. Even though many of them do not sell direct to farmers, the producers commonly draw up their price lists on the basis of sale to the farmer, including delivery to his nearest station, and allow the merchant or co-operative society a discount or commission at a fixed cash rate per ton. The merchant, if he delivers to the farm, usually adds a sum to the list price for transport from the station. He may also make an addition for credit of about £1 or 30s. per ton, which may be given back in whole or part according to the date of payment. An allowance typical of the fertiliser industry is the early delivery rebate or seasonal price reduction which is commonly made on sulphate of ammonia, potash and compounds. The effect is to provide a scale of diminishing allowances over the months July to February (May to January for potash) and the aim is to encourage purchases in the autumn and early winter and so relieve some of the pressure on manufacturers at the time of the spring sowings.